

General Guide to RoadPlus Editor

Version 4.0 English



System GPS500

Congratulations on your purchase of a new Leica System GPS500.

View of chapters

to PoodPlug Editor 400an	3	View of chapters	
Glossary			108
The Station Equation			100
The Cross Section Assi	gnment		91
The Cross Section			73
The Vertical Alignment			60
The Horizontal Alignme	nt		43
Starting the RoadPlus E	ditor		41
Data Files and Formats			22
Design Elements			8
Introduction			6

General Guide to RoadPlus Editor - 4.0.0en

Contents

Introduction	6
Activation of the Application	6
Requirements	7
Design Elements	8
The Horizontal Alignment	
The Vertical Alignment	
The Cross Section	
The Cross Section Assignment	
The Station Equation	
Data Files and Formats	22
The Horizontal Alignment File	
Example for a Horizontal Alignment File in Leica	
GSI format	
Header of a Horizontal Alignment File in Leica	04
GSI IOIIIIdi Data lina for a principla point in a Harizantal	24
Alignment File in Leica GSI format	25
The Vertical Alignment File	23 27
Example for a Vertical Alignment File in Leica	
GSI format	
Header of a Vertical Alignment File in Leica	
GSI format	
Data line for a principle point in a Vertical	
Alignment File in Leica GSI format	

The Cross Section (Template) File
in Leica GSI format
The Cross Section Assignment File
Example for a Cross Section Assignment File
in Leica GSI format
Header of a Cross Section Assignment File
in Leica GSI format
Data line in a Cross Section Assignment File
in Leica GSI format
The Station Equation File
Example for a Station Equation File in
Leica GSI format
Detailing in a Station Equation In Leica GSI format
Leice CSI format
Leica GSI 101111at
Starting the RoadPlus Editor 41
The Hevisentel Alignment 42
i ne Horizontal Alignment 43
Managing Horizontal Alignments43
Creating a Horizontal Alignment44
Editing a Horizontal Alignment55
Editing an Existing Element in a Horizontal Alignment 55
Inserting an Element in a Horizontal Alignment

Deleting an Existing Element in a Horizontal Alignment Copying a Horizontal Alignment	58 59
The Vertical Alignment	. 60
Managing Vertical Alignments	60
Creating a Vertical Alignment	61
Editing a Vertical Alignment	68
Editing an Existing Element in a Vertical Alignment	68
Inserting an Element in a Vertical Alignment	70
Deleting an Existing Element in a Vertical Alignment	71
Copying a Vertical Alignment	72
The Cross Section	. 73
Managing Cross Sections	73
Creating a Cross Section	74
Editing a Cross Section	82
Editing an Existing Cross Section Template	83
Inserting a New Cross Section Template	88
Deleting an Existing Cross Section Template	88
Copying a Cross Section	89

The Cross Section Assignment	91
Creating a Cross Section Assignment Files	91 92
Editing a Cross Section Assignment File	95
Editing an Existing Cross Section Assignment	
Inserting a New Cross Section Assignment	97
Deleting an Existing Cross Section Assignment	97
Copying a Cross Section Assignment File	
The Otetien Equation	
The Station Equation	100
Managing Station Equation	 100
Managing Station Equation Creating a Station Equation	 100 100 101
Ine Station Equation Managing Station Equations Creating a Station Equation Editing a Station Equation	100 100 101 104
Ine Station Equation Managing Station Equations Creating a Station Equation Editing a Station Equation Editing an Existing Station Equation	 100 100 101 104 105
Ine Station Equation Managing Station Equations Creating a Station Equation Editing a Station Equation Editing an Existing Station Equation Inserting a New Station Equation	 100 100 101 104 105 106
Ine Station Equation Managing Station Equations Creating a Station Equation Editing a Station Equation Editing an Existing Station Equation Inserting a New Station Equation Deleting an Existing Station Equation	100 100 101 104 105 106 106

Introduction

This manual is an introduction to the application program RoadPlus Editor for the Leica GPS Sytem500. The RoadPlus Editor is for creating and basic editing of special GSI files which are used by the GPS System500 onboard application RoadPlus.

The RoadPlus Editor supports these alignment file types:

- horizontal alignments
- vertical alignments
- cross sections
- cross section assignments
- station equations

It also supports checking horizontal alignments for errors.

RoadPlus Editor is **not** an on board road planning and design application. It is only intended for quick and easy modification of existing alignments, or creation of new ones.

Activation of the Application

The application is activated by an access code which is provided by Leica. If the application does not appear on your menu or you are otherwise unable to access it, please contact your Leica representative.

Requirements

You must be familiar with the principles and procedures that are outlined in the "Technical Reference Manual".

If the material referenced is not thoroughly understood, it is strongly adviced that you review them prior to proceeding with this application program.

Within this manual, it is assumed that you are familiar with the operation of the system.



Design Elements

A road surface can be thought of three different types of design elements:

- the horizontal alignment
- the vertical alignment
- the cross section



The Horizontal Alignment

The horizontal alignment defines the road axis of a project.

The constituting elements of a horizontal alignment are

- tangents (straight segments)
- circles
- clothoïdes (spiral in/out, curve in/out).

Each constituting element is defined by individual **horizontal design elements** such as station, easting, northing, radius and parameter A.





For the reason of completness, a short summary of the design elements for horizontal alignment is included in this chapter.

The Tangent - straight line between two points. It's end point is identical with the beginning of a curve or spiral. The tangent is perpendicular to the radius of the curve.







The Curve - circular curve with constant radius.







Curve in - spiral transition from larger to smaller radius curve. Parameter A

station E_1 , N_1 R_2 R_3 R_2 R_3 R_2 R_3 R_3 R_2 R_3 $A^2 = R \times L$

- R radius of the connecting circular curve
- L length of the spiral in/out or curve in/out

Curve out - spiral transition from smaller to larger radius curve.

station E_1 , N_1 R_1 R_2 R_2 parameter A

Curve in and out are used for combinations such as:

```
curve - curve in - curve out - curve
or
tangent - spiral in - curve in - curve
```

whereas spiral in/out always connect a tangent with a curve / curve in / curve out.

Sign convention for curves and spirals:

centre of curvature to left of centre line: R resp. A < 0 centre of curvature to right of centre line: R resp. A > 0

Or in words: Looking in the direction of increasing station, apply the "right hand positive rule".

The Vertical Alignment

The vertical alignment gives information about the pattern of heights of the road axis as it is defined in the horizontal alignment.

The constituting elements of a vertical alignment are

- tangents (straight segments)
- circles
- parabolas.

Each constituting element is defined by individual **vertical design elements** such as station, easting, northing, radius and parameter P.



For the reason of completness, a short summary of the design elements for vertical alignment follows.

The Tangent - straight line between two points. It's end point is identical with the beginning of a curve or spiral. The tangent is perpendicular to the radius of the curve.



The Parabola - a parabolic vertical curve with constant rate of grade change.



The Curve - circular vertical curve with constant radius.



Sign convention for curves and parabolas:

centre of curvature below the alignment and curvature over the alignment: R resp. P < 0 centre of curvature above the alignment and curvature under the alignment: R resp. P > 0 **Parameter P** - is the reciprocal of the rate of change of grade in the vertical curve. Three formulas for the calculation of P exist:

- 1. $P = L / (G_{out} G_{in})$
- L length as horizontal distance from the beginning to the end of the vertical curve
- ${G_{_{in}}} \qquad \mbox{grade of the vertical alignment at the beginning of the vertical curve}$
- G_{out} grade of the vertical alignment at the end of the curve

 ${\rm G}_{_{\rm in}}$ and ${\rm G}_{_{\rm out}}$ in decimal units (not percent) negative for decreasing elevation with increasing station.

2. $P = (S - S_0)^2 / 2(H - H_0)$

- S any station (chainage) on the parabola
- S₀ station (chainage) of the high/low point of the parabola
- H height at any station S of the parabola
- H_o height of the high / low point of the parabola

3. P = 1 / 2a

whereas a is a parameter in the general equation for a parabola in mathematics $Y = aX^2 + bX + c$.

- Y elevation of vertical curve above datum
- X horizontal distance from the beginning of the vertical curve
- a one half of the rate of change of grade in the vertical curve
- b Grade of the vertical alignment at the beginning of the vertical curve
- c elevation above datum at the beginning of the vertical curve

Design Elements

The Cross Section

A cross section gives a profile view. It requires vertical alignment or actual elevation on each station.

The **constituting elements** are straight elements. The points are called vertices. You may optionally define slopes at the vertices most left and most right.

Points are definined by:

- ΔH and ΔV
- ∆H and slope in percentage
- ΔH and slope ratio
- ΔH horizontal distance from the centre line
- ΔV vertical distance from the centre line (vertical alignment or actual elevation mandatory)



Sign convention for cross sections:

Sign convention is based on horizontal and vertical alignments. left or below centre line: right or above centre line: +

Slope ratio definition:

Percentage is exclusively used as slope ration definition in the RoadPlus Editor.

The Cross Section Assignment

One cross section is valid until a new one is defined at a station ahead.

Cross section definition can be at **any** station. The stations need not necessarily correspond to stations where a design element starts or ends.



General Guide to RoadPlus Editor - 4.0.0en

For the reason of completness, widening and superelevation as part of cross sections are mentioned here.

Widening - increase / decrease of road width with change in number of lanes.

Widening influences the shape of the cross sections. RoadPlus has the ability to interpolate cross sections between beginng and end of the widening.



Superelevation - modification of the normal pavement cross slope. Intended to increase comfort and safety at speed.



The Station Equation

Station Equations define adjustments for the stationing values in the Horizontal Alignment File. These adjustments may be necessary when the horizontal alignment has been modified by inserting or removing a constituing element and the stationings in the Horizontal Alignment File were not recomputed. This can be the case when editing manually or with a program which does no automatic recomputation. Simply speaking, station equations define leaving a gap or allow an overlap at certain stations.

The constituting elements in the equations are

station back

٠

station ahead.



Due to removing a constituing element, the sequence of stationing misses some values. If this is the case, a **gap equation** (forward station equation) is required. The station equation is of the form:

Where the sequence of stationing repeats some values after inserting a design element, we speak of an **overlap equation** (backward station equation). Then, the equation is of the form:

Station Ahead y+yyy = Station Back x+xxx



The stations between 0+450.725 and 0+550.725 will be ignored.

Station Ahead y+yyy = Station Back x+xxx



Stations between 0+450.725 and 0+550.725 exist twice and require re-organizing.

Data Files and Formats

As mentioned in the chapter "Design Elements", a road surface is described by three different design elements - horizontal alignment, vertical alignment and cross section.

The elements of each of these components are kept in individual data files.

The files are in the Leica GSI file format. The common extension is .gsi. However they are distinguished by three letter file name prefixes which define the file type and must be used when creating the files. The question marks in the example file names may be replaced with any DOS permitted file name character.

Horizontal Alignment File	ALN????.GSI
Vertical Alignment File	PRF????.GSI
Cross Section (Template) File	CRS????.GSI
Cross Section Assignment File	STA????.GSI
Station Equation File	EQN????.GSI

The data files in GSI format can be created either by using the onboard application RoadPlus Editor, the Leica program RoadEd or by converting files from different road packages.

The data files in GSI format created by any of these three meothds can be edited using the onboard application RoadPlus Editor.

New files created with RoadPlus Editor are written to the GSI directory of the PC card or internal memory if available. Files to be edited with RoadPlus Editor must be kept in the same directory.



For creating and editing these files in RoadPlus Editor, a local coordinate system is required since coordinates are displayed as Easting and Northings.

Example for a Horizontal Alignment File in Leica GSI format

All parameters describing the constituting elements of a horizontal alignment build a so called Horizontal Alignment File. The following is an example of a Horizontal Alignment File in Leica GSI8 format. GSI16 is also supported. A Horizontal Alignment File must contain at least a header and two elements. The last element must be EOP.

41....+OEXAMPLE 42....+HZALIGNM 43....+STACOORD 11....+O0000000 71....+STRAIGHT 72....+O0000NON 73....+QP000125 81..10+06000000 82..10+02000000 11....+O0198832 71....+OOSPIRIN 72....+O0122474 73....+QP000123 81..10+06068005 82..10+02186841 11....+O0348832 71....+OOCURVE 72....+O0100000 73....+QP000123 81..10+06150344 82..10+02307751 11....+00450724 71....+OSPIROUT 72....+O0100000 73....+QP000123 81..10+06247816 82..10+02304071 11....+00550725 71....+STRAIGHT 72....+O0000NON 73....+QP000125 81..10+06310759 82..10+02227794 11....+00619253 71....+00000EOP 72....+00000NON 73....+QP000100 81..10+06345023 82..10+02168447

3

Note that each line must end with a space and that a CR/LF is required after the last data line.

Header of a Horizontal Alignment File in Leica GSI format

The header is the first line in the GSI file. There is only one header line per file. The header line takes the following form:

41....+0EXAMPLE 42....+HZALIGNM 43....+STACOORD

WI 41	Job identification, maximum 8 ASCII characters, may be defined by user.
WI 42	Identification of Horizontal Alignment File, may not be changed by user. This entry must be +HZALIGNM.
WI 43	Identification of principal point type file, may not be changed by user. This entry must be +STACOORD.

11....+00198832 71....+00SPIRIN 72....+00122474 73....+QP000123 81..10+06068005 82..10+02186841

WI 11	Station (chainage) of principal point. Data units and decimal places are defined by WI 81 and WI 82.
WI 71	Type of the following geometric element.
WI 72	Radius 1 for compound curve resp. A parameter for spirals. If the radius point for a curve is to the right of the alignment (looking in the direction of increasing stations), the radius is positive, otherwise negative. Data units and decimal places are defined by WI 81 and WI 82. Default for tangents and End of Project is 00000NON.
WI 73	Number of cross section assigned to the next geometric element. Corresponds to WI 11 in Cross Section File. A cross section may be assigned to more than one location.
WI 74	Radius 2 for compound curves. If the radius point for a curve is to the right of the alignment (looking in the direction of increasing stations), the radius is positive, otherwise negative. Data units and decimal places are defined by WI 81 and WI 82.
WI 81	Easting of principle point.
WI 82	Northing of principle point.

The following table shows for all possible elements of a horizontal alignment, the variables and predefined names which are required for each WI in a Horizontal Alignment File.

Element	WI 11	WI 71	WI 72	WI 73	WI 74	WI 81	WI 82
Tangent	Station	STRAIGHT	00000NON	Cross Section Number		Easting	Northing
Circular Curve	Station	000CURVE	R	Cross Section Number		Easting	Northing
Spiral - Tangent to Curve	Station	00SPIRIN	A	Cross Section Number		Easting	Northing
Spiral - Curve to Tangent	Station	0SPIROUT	A	Cross Section Number		Easting	Northing
Spiral - Curve to Curve (R1>R2)	Station	0CURVEIN	R1	Cross Section Number	R2	Easting	Northing
Spiral - Curve to Curve (R1 <r2)< td=""><td>Station</td><td>CURVEOUT</td><td>R1</td><td>Cross Section Number</td><td>R2</td><td>Easting</td><td>Northing</td></r2)<>	Station	CURVEOUT	R1	Cross Section Number	R2	Easting	Northing
EOP	Station	00000EOP	00000NON			Easting	Northing

The Vertical Alignment File

Example for a Vertical Alignment File in Leica GSI format

All parameters describing the constituting elements of a vertical alignment build a so called Vertical Alignment File. The following is an example of such file in Leica GSI8 format. GSI16 is also supported. An Vertical Alignment File must contain at least a header and two elements. The last element must be EOP.

41+OEXAMPLE	42+OVALIGNM	43+STACOORD	
11+00000000	71+STRAIGHT	72+00000NON	8310+00400000
11+00300000	71+000CURVE	7201142932	8310+00422500
11+00500000	71+STRAIGHT	72+00000NON	8310+00420000
11+00550000	71+PARABOLA	72+02091126	8310+00415000
11+00850000	71+STRAIGHT	$72\ldots + 00000$ NON	8310+00406522
11+01127904	71+00000EOP	72+00000NON	8310+00418605



Note that each line must end with a space and that a CR/LF is required after the last data line.

Header of a Vertical Alignment File in Leica GSI format

The header is the first line in the GSI file. There is only one header line per file. The header line takes the following form:

41....+0EXAMPLE 42....+0VALIGNM 43....+STACOORD

WI 41	Job identification, maximum 8 ASCII characters, may be defined by user.
WI 42	Identification of Vertical Alignment File, may not be changed by user. This entry must be +0VALIGNM.
WI 43	Identification of principal point type file, may not be changed by user. This entry must be +STACOORD.

11....+00300000 71....+000CURVE 72....-01142932 83..10+00422500

WI 11	Station (chainage) of a vertical alignment point. The stationing is projected onto a horizontal plane. Data units and decimal places are defined by WI 83.
WI 71	Type of the following geometric element.
WI 72	Radius for following curve or P parameter for parabolas. If the radius point for a curve/parabola lies above the centre line, the radius or P is positive, otherwise negative. Data units and decimal places are defined by WI 83. Default for tangents and End of Project is 00000NON.
WI 83	Elevation of the point.

The following table shows for all possible elements of a vertical alignment, the variables and predefined names which are required for each WI in a Vertical Alignment File.

Element	WI 11	WI 71	WI 72	WI 83
Tangent	Station	STRAIGHT	00000NON	Ordinate
Circular Curve	Station	000CURVE	R	Ordinate
Parabola	Station	0PARABOL	Ρ	Ordinate
EOP	Station	00000EOP	00000NON	Ordinate

The Cross Section (Template) File

Example for a Cross Section File in Leica GSI format

All parameters describing the constituting elements of a cross section build a so called Cross Section (or Template) File. The following is an example of such a file in Leica GSI8 format. GSI16 is also supported.

A Cross Section File must contain at least one cross section. 200 cross sections per file are allowed. One cross section may be described by up to 64 vertices (points).

41....+OEXAMPLE 42....+TEMPLATE 11....+OP000123 35..10-00013000 36..10-00003000 11....+QP000123 35..10-00010000 36..10-00005000 11....+OP000123 35..10-00004000 36..10-00000100 11....+QP000123 35..10+00004000 36..10+00000100 11....+OP000123 35..10+00010000 36..10-00006000 11....+QP000123 35..10+00013000 36..10-00003500 11....+OP000124 35..10-00012000 36..10-00002000 11....+QP000124 35..10-00011000 36..10-00004000 11....+QP000124 35..10-00004000 36..10-00000100 11....+OP000124 35..10+00004000 36..10-00000100 11....+OP000124 35..10+00011000 36..10-00005000 11....+OP000124 35..10+00012000 36..10-00002500 11....+TEMPLATE 35..10-00002000 36..10+00000000 71....+0000FILL 72....+00002000 11....+TEMPLATE 35..10-00000500 36..10+00000000 71....+0000FILL 72....+00002000 . . .



Note that each line must end with a space and that a CR/LF is required after the last data line.

Header of a Cross Section File in Leica GSI format

The header is the first line in the GSI file. There is only one header line per file. The header line takes the following form:

41....+0EXAMPLE 42....+TEMPLATE

WI 41	Job identification, maximum 8 ASCII characters, may be defined by user.
WI 42	Identification of Cross Section File, may not be changed by user. This entry must be +TEMPLATE.

11....+QP000124 35..10+00012000 36..10-00002500 11....+TEMPLATE 35..10-00002000 36..10+00000000 71....+0000FILL 72....+00002000

WI 11	Cross section number, corresponds to WI 73 in the Horizontal Alignment File. Cross section numbers need not be in as- or descending order. However, all data lines having the same cross section number belong together and should be kept together. The data lines for one cross section must be sorted from left to right across the section.
WI 35	Horizontal distance from centre line. A positive distance indicates a point to the right of the centre line. A negative distance indicates a point to the left of the centre line.
WI 36	Height difference from the centre line. A positive height difference indicates a point above the centre line. A negative height difference indicates a point below the centre line.
WI 71	Cross section type; optional.
WI 72	Slope ratio as dH/dV; optional. 0 allowed for all but leftmost and rightmost points in a cross section. Data units defined by WI 35 and WI 36.

The following table shows the two possibilities for defining vertices of a cross section and the predefined names which are required for each WI in a Cross Section File.

Element	WI 11	WI 35	WI 36	WI 71	WI 72
Vertex (using vertical alignment)	Cross Section Number	Horizontal Offset	Vertical Offset	00000CUT 0000FILL	Slope
Vertex (without vertical alignment)	Cross Section Number	Horizontal Offset	Elevation	00000CUT 0000FILL	Slope

The Cross Section Assignment File

Example for a Cross Section Assignment File in Leica GSI format

The Cross Section Assignment File defines the stations for the cross sections. Note that the stations given for the cross sections do not necessarily correspond to stations where design elements start or end. The following is an example of such a file in Leica GSI8 format. GSI16 is also supported.

A Cross Section Assignment File belongs to a corresponding Cross Section File. You must have a Cross Section Assignment File when using a Cross Section File. The number of assignments is restricted to 100 per file. A cross section remains valid until a new cross section is assigned. A given cross section may be assigned more than once. Automatic transitions such as width and superelevation are possible.

41....+OEXAMPLE 42....+ASSIGNMT 43....+CRSEXAMP 11....+QP000123 71....+00050000 11....+TEMPLATE 71....+00100000 11....+QP000124 71....+00250553 11....+QP000123 71....+00350000 11....+QP000124 71....+00500000 11....+TEMPLATE 71....+00600000



Note that each line must end with a space and that a CR/LF is required after the last data line.

Header of a Cross Section Assignment File in Leica GSI format

The header is the first line in the GSI file. There is only one header line per file. The header line takes the following form:

41....+0EXAMPLE 42....+ASSIGNMT 43....+CRSEXAMP

WI 41	Job identification, maximum 8 ASCII characters, may be defined by user.
WI 42	Identification of Cross Section Assignment File, may not be changed by user. This entry must be +ASSIGNMT.
WI 43	Name of the corresponding Cross Section File. The named file must exist in the active directory on the PC card to use an assignment file.
11....+QP000123 71....+00100000

WI 11	Cross section number, corresponds to WI 11 in the Cross Section File and WI 73 in the Horizontal Alignment File.
WI 71	Beginning chainage for the particular cross section.

For the matter of completion, the following table is added as in the previous chapters.

Element	WI 11	WI 71
Assignment	Cross Section Number	Station

The Station Equation File

Example for a Station Equation File in Leica GSI format

The Station Equation File re-defines horizontal alignments after adding / removing constituing elements. Station Equation Files are optional for RoadPlus and only required when stationings have not been recomputed after changes in the Horizontal Alignment File. The number of equations per file is limited to 64.

The following is an example of such a file in Leica GSI8 format. GSI16 is also supported.

41....+OEXAMPLE 42....+OSTAEQTN 41....+00000000 42....+00550725 43....+00450725 41....+00000001 42....+00560000 43....+00460000 41....+00000002 42....+00570000 43....+00470000 ...



Note that each line must end with a space and that a CR/LF is required after the last data line.

If you use the Leica application program RoadPlus Editor for your editing, you really should not need to use a station equation file because it will always attempt to adjust the stationings for you as you make changes. However, RoadPlus Editor does support the creation and editing of these files if they are needed. Be aware of the fact that RoadPlus Editor does not read the station equation file when it checks for errors in your alignment. You can ignore stationing errors which you have corrected using a station equation file.

Header of a Station Equation in Leica GSI format

The header is the first line in the GSI file. There is only one header line per file. The header line takes the following form:

41....+0EXAMPLE 42....+0STAEQTN

WI 41	Job identification, maximum 8 ASCII characters, may be defined by user.
WI 42	Identification of Station Equation File, may not be changed by user. This entry must be +0STAEQTN.

41....+00000000 42....+00550725 43....+00450725

WI 41	Station equation number
WI 42	Station ahead
WI 43	Station back

For the matter of completion, the following table is added as in the previous chapters.

Element	WI 41	WI 42	WI 43
Equation	Station Equation Number	Station Ahead	Station Back

Starting the RoadPlus Editor

Switch the receiver ON > Main Menu Select 3 Applications ... CONT (F1)

MAINN
1 Survey
<u>2 Stake-Out</u>
3 Applications
4 Utilities
5 Job
6 Configure
7 Transfer
CONT

Panel APPLICATION \ Menu



11 RoadPlus Editor

CONT (F1)

Panel RoadPlus Editor

CONF (F2) for defining the RoadPlus Editor parameters.

Panel RoadPlus Configuration

RoadP:	lus Co	nfiguration
Defl.	Tol.:	0.0050 9
Sta.	TO1.:	0.010 m
Check	Prmp:	YES♥

CONT

Defl. Tol. - The deflection tolerance is the tolerance value used for determining deflection errors. A deflection error occurs when the beginning curve tangent of an element does not match the ending tangent of the previous element. If the actual error in deflection is greater than this value, the error will be reported.

Sta. Tol. - The stationing tolerance is the tolerance value used for determining stationing errors. A stationing error occurs when the actual stationing value computed by RoadPlus Editor does not equal the value given in the file. If the actual error in stationing is greater than this value, the error will be reported.

Check Prmp - If set to **YES**, each time a new alignment element has been entered, a confirmation message displays the end coordinates for checking.

When all input fields have been set correctly:

CONT (F1)

From **panel RoadPlus Editor** the design elements can be accessed.

The Horizontal Alignment

The Horizontal Alignment component of the application program RoadPlus Editor allows the creation, editing and deleting of the following elements

- Start Point
- Straight (Tangent)
- Curve
- Spiral
- Spiral Curve

as well as checking the horizontal alignment.

Managing Horizontal Alignments

Panel RoadPlus Editor

RoadPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

1 Horizontal Alignment

This accesses the **panel MANAGE****Horiz. Alignment** from where horizontal alignment files can be created, edited, deleted and copied.

MANAGEN Horiz. A	lignment
- <u>-Horizontal-ALN</u>	·
ALNCAT	PC-Card
ALNDOG	PC-Card
ALNMOUSE	PC-Card

CONT NEW EDIT DEL COPY

CONT (F1) returns to the panel RoadPlus Editor.

NEW (F2) creates a new horizontal alignment file. See chapter "Creating a Horizontal Alignment".

Creating a Horizontal Alignment

EDIT (F3) edits the horizontal alignment file. See chapter "Editing a Horizontal Alignment".

DEL (F4) deletes a horizontal alignment file.

COPY (F5) copies the horizontal alignment file. See chapter "Copying a Horizontal Alignment".

Panel RoadPlus Editor

RoadPlus Editor 1 Horizontal Alignment 2 Vertical Alignment

3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

1 Horizontal Alignment

Panel MANAGE\ Horiz. Alignment

MANAGEN Horiz. A	lignment
	PC-Card PC-Card
ALNMOUSE	PC-Card

CONT NEW EDIT DEL COPY

NEW (F2)

Panel HORIZ ALN\ New

HORIZ ALN\ New Name (ALN): Job ID :	CAMEL 998
Device Format Units m\ft: Dist Dec. :	PC-CARD▼ GSI-16▼ Metre▼ 3
CONT	

Name <ALN> - Enter a 5 digit name. The system automatically adds ALN as prefix and the extension gsi. Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - Options are **Metre** and **US Feet** as units in which all values will be stored in the GSI file. This can differ from the units configured on the sensor for displaying.

Dist Dec. - Set the number of decimals used for the distance. **Angle Dec.** - Set the number of decimals used for the angle.

CONT (F1)

Panel INSERT ELEMENT\ Start Point

INSERT ELS Start Stn	MENTN	Start Point 100.000	M
Start E.	:	17570.083	M
Start N.		16624.402	M

CONT

- Start Stn Enter the start station for the horizontal alignment.
- Start E. The Easting for the start station.
- Start N. The Northing for the start station.

Alternatively, press **GetPt (F2)** when the focus is on the Start E. line or Start N. line to select an existing point from the database.

Point\ <	>>
Point Id	—Time -Date -
CAMEL1	17 04 28 04
CAMEL2	17:04 28.04
COMEL 3	17:05 28:04
COMEL 4	17:06 28:04
CAMELS	17:06 28.04
	U,
	<u> </u>
CONT NEW EDIT	DEL INFO aNUM

Highlight the point to be selected.

CONT (F1)

45

CONT (F1)

Select the type of element to be created and press **CONT(F1)**.

Panel HORIZ ALN\ ALN????.GSI

where ALN????.GSI is the horizontal alignment file name.

HORIZ	ALNN P	ILNCAM	EL.GSI		
-Nr -	——Sta	ntion-	——Elem	ient	
0	100	.000	Start	Pt	

CONT NEW EDIT DEL CHECK

The recently created element of the horizontal alignment is displayed. The list shows the element number, the end station in the units defined for display through the CONFIG key and the type of element. New elements are always inserted after the highlighted element.

NEW (F2) brings you to the INSERT ELEMENT menu.

Iľ	ISERT ELEMENT
1	Straight
2	CURUO

- z Curve 3 Spiral
- 4 Spiral Curve

CONT

Straight

This function enables you to define a straight for the horizontal alignment.

ELEMENT\ Sti	° ai	ight
Start Stn		100.000 m
Azimuth		0.0000 9
Length		20.000 m
End Stn		120.000 m
End E.		17570.083 m
End N.		16644.402 m

CONT GETPT

Start Stn - The end station of the previous element is automatically used and cannot be edited.

Azimuth - The azimuth displayed is from the previous element. Another value can be entered manually.

Length - Length of the straight element.

End Stn - Station at the end of the element.

End E. and **End N.** - Enter the Easting and Northing for the end station. Alternatively, press **GetPt (F2)** when the focus is on the End E. End N. line to select an existing point from the database.

When enough design elements are available, then the remaining design elements are calculated. For example: Values for the Start Stn, the Azimuth and the Length have been entered, then the End Stn, the End E. and the End N. are calculated automatically.

CONT (F1)

	ORIZ	ALNN ALNCAM	EL.GSI	
r	Nr	Station-	——Element——	٦
		100.000	<u>Start Pt</u>	
	1	120.000	Straight	
L				

CONT NEW EDIT DEL CHECK

The straight element is added to the list of elements of the horizontal alignment.

Curve

This function enables you to define a curve for the horizontal alignment. A curve can be defined by three methods using different design elements

- Radius&Length, using the radius of the curve and its length
- Radius&EndStn, using the curve's radius and end station
- Radius&DltAng, using the radius and delta angle of the curve.

ELEMENTS CUPY	/e
Method :	Radius&EndStn♥
Start Stn 🛛 🕄	120.000 m 🗌
TAN (Start) :	0.000 9
Curve Direct:	RIGHT
Radius :	1000.000 m
End Stn :	220.000 m
End E. :	17575.079 m 🗋
CONT	

Method - Select one of the methods Radius&Length, Radius&EndStn, Radius&DltAng.

Start Stn - The end station of the previous element is automatically used and cannot be edited.

TAN <Start> - The azimuth of the tangent in the start point. As default, this is used from the previous element. The value can be edited. To reset the default values after a change press **DEFLT (F5)** when focus is on this line.

Curve Direct - Looking in the direction of increasing stationing, the direction of the curve can be **RIGHT** or **LEFT**. **Radius** - Radius of the curve. The signs are set by the system depending on the curve direction defined in **Curve Direct**. **Curve Length** - Only available for method Radius&Length. Length from the start to the end point of the curve. **Delta Angle** - Only available for Radius&DItAng. The deflection angle.

End Stn - Only available for Radius&EndStn and Radius&DltAng. The end station of the curve element can be typed in.

End E. and **End N.** - Easting and Northing for the end station are calculated according to the values given and cannot de edited.

When enough design elements are available, then the remaining design elements are calculated.

CONT (F1)

continued ...

Curve co	ontinued		
HOBIZ 8	INN BENCOM	EL .GST	
-Nr	-Station-	Element	_
0	100.000	Start Pt	
1	120.000	Straight	
2	220.000	Curve	

CONT NEW EDIT DEL CHECK

The curve element is added to the list of elements of the horizontal alignment.

Spiral

This function enables you to define a spiral for the horizontal alignment. A spiral as the connecting element between a tangent and a curve can be defined by three methods using different design elements

- Radius&Length, using the radius of the connecting curve and its length
- Radius&EndStn, using the radius of the connecting curve and the end station of the spiral
- Param&EndStn, using the parameter A and the end station of the spiral.

ELEMENT\ Spiral				
Method :	Radius&Length♥			
Start Stn 🛛 🗄	320.000 m			
TAN (Start) :	6.3662 g			
SPRL In/Out :	IN▼			
SPRL Direct :	RIGHT♥			
Radius :	1000.000 m			
Curve Length:	130.000 m			
CONT	DEFLT			

Method - Select one of the methods Radius&Length, Radius&EndStn, Param&EndStn.

Start Stn - The end station of the previous element is automatically used and cannot be edited.

TAN <Start> - The azimuth of the tangent in the start point. This is used from the previous element. The value can be

edited. To reset the default values after a change press **DEFLT (F5)** when focus is on this line.

SPRL In/Out - For a spiral transition from tangent to curve select **IN**, for a spiral transition from curve to tangent select **OUT**.

SPRL Direct - Looking in the direction of increasing stationing, the direction of the spiral can be **RIGHT** or **LEFT**. **Radius** - Only available for Radius&Length and Radius&EndStn. Radius of the spiral. The signs are set by the system depending on the spiral direction defined in **SPRL Direct**.

Curve Length - Only available for method Radius&Length. Length from the start to the end point of the spiral.

Parameter A - Only available for Param&EndStn. Enter the parameter A defining the spiral.

End Stn - Only available for Radius&EndStn and Param&EndStn. The end station of the curve element can be typed in.

End E. and **End N.** - Easting and Northing for the end station are calculated according to the values given and cannot de edited.

When enough design elements are available, then the remaining design elements are calculated.

continued ...



Spiral Curve

This function enables you to define a spiral curve for the horizontal alignment. A spiral curve is the transition element from larger to a smaller curve and vice versa and can be defined by the radius of the curve and its length.

ELEMENTN Spir	al Curve
Method :	Radius&Length
Start Stn 🛛 🕄	: 450.000 m ∏
TAN (Start) :	10.5042 g
SPRL In/Out :	IN▼
SPRL Direct :	RIGHT♥
Start Radius	: 1000.000 m
Curve Length:	: 100.000 m 🗌
CONT	DEFLT

Method - **Radius&Length** is predefined and cannot be edited. **Start Stn** - The end station of the previous element is automatically used and cannot be edited.

TAN <Start> - The azimuth of the tangent in the start point. This is used from the previous element. The value can be edited. To reset the default values after a change press **DEFLT (F5)** when focus is on this line.

SPRL In/Out - For a spiral transition from a larger to a smaller radius curve select **IN**, for a spiral transition from a smaller to a larger radius curve select **OUT**.

SPRL Direct - Looking in the direction of increasing stationing, the direction of the spiral can be **RIGHT** or **LEFT**.

Start Radius - Radius of the starting curve. The signs are set by the system depending on the spiral direction defined in **SPRL Direct**.

Curve Length - Length from the start to the end point of the spiral.

End Radius - The exit radius of the spiral curve. The signs are set by the system depending on the spiral direction defined in **SPRL Direct**.

End E. and **End N.** - Easting and Northing for the end station are calculated according to the values given and cannot de edited.

When enough design elements are available, then the remaining design elements are calculated.

continued ...

Spiral Curve continued
CONT (F1)
HORIZ ALNN ALNCAMEL.GSI NrStationElement 1 120.000 Straight 2 220.000 Straight 3 320.000 Straight 4 450.000 Spiral In 5 550.000 Curve In CONT NEW EDIT DEL CHECK
The spiral curve element is added to the list of elements of the horizontal alignment.

From the list of elements of the horizontal alignment, an element can be highlighted and then edited with **EDIT (F3)** or deleted with **DEL (F4)**. Please refer to chapter "Editing a Horizontal Alignment" for more information.

HORIZ	ALNN ALNCAM	IEL.GSI
-Nr	Station-	——Element——
1	120.000	Straight
2	220.000	Curve
3	320.000	Straight
4	450.000	Spiral In
5	550.000	Curve In

CONT NEW EDIT DEL CHECK

Once all elements are entered correctly check the horizontal alignment.

CHECK (F5)

CONT (F1)

The GSI file for the horizontal alignment is created and stored.

Editing a Horizontal Alignment

Editing an Existing Element in a Horizontal Alignment

Panel RoadPlus Editor

RoadPlus Editor 1 Horizontal Ali<u>gnment</u>

2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

1 Horizontal Alignment

Panel MANAGE\ Horiz. Alignment

MANAGEN Horiz. Al	ignment
-Horizontal-ALN-	
ALNCAT	PC-Card
ALNDOG	PC-Card
ALNMOUSE	PC-Card

CONT NEW EDIT DEL COPY

Move the focus bar to the horizontal alignment file to be edited.

EDIT (F3)

This leads to **panel HORIZ ALN\ALN????.GSI**. From this panel, elements can be edited, inserted and deleted.

Panel HORIZ ALN\ ALN????.GSI

where ALN????.GSI is the horizontal alignment file name.

HORIZ	ALN\ ALNCAT	.GSI
-Nr	Station-	——Element——
0	0.000	Start Pt
1	3.381	Straight
2	302.280	Curve
3	398.280	Curve In
4	579.283	Curve

CONT NEW EDIT DEL CHECK

Move the focus bar to the element to be edited.

EDIT (F3)

The subsequent input panel depends on the element being edited. For a definition of the input panels please refer to chapter "Creating a Horizontal Alignment". Edit the element as required.

CONT (F1)

l	INSERT ELEMENT\ Confirmation
1	Confirmation
	You have moved a coordinate in the alignment . Do you want
	to shift the rest of the
	alignment (YES) or the next
	element only (NO)

ABORT NO YES

ABORT (F1) does not save the changes.

YES (F3) stores the changes and shifts all elements of the alignment by the same amount. The coordinates and stations are updated, all other values are maintained.



NO (F5) stores the changes, recalculates the coordinates of only the following element and updates all stations. The coordinates of all other design elements are maintained.



where ALN????.GSI is the horizontal alignment file name.

HORIZ	ALNN ALNCAT	.GSI
-Nr	Station-	Element
Ø	0.000	Start Pt
1	103.381	Straight
2	312.064	Curve
3	576.064	Curve In
4	757.067	Curve

CONT NEW |EDIT |DEL |CHECK

In the list of elements all stations are updated.

CONT (F1)

The GSI file for the horizontal alignment is updated and stored.



Inserting an Element in a Horizontal Alignment

Panel HORIZ ALN\ ALN????.GSI

where ALN????.GSI is the horizontal alignment file name.

F	IORIZ	ALNN ALNCAT	.GSI
	Nn	Station-	Element
	0	0.000	Start Pt
	1	3.381	Straight
	2	302.280	Curve
	3	398.280	Curve In
	4	579.283	Curve

CONT NEW EDIT DEL CHECK

Elements are always inserted **after** the one highlighted. No element can be inserted before the starting point. Move the focus bar to the desired position.

NEW (F2)

Panel INSERT ELEMENT

INSERT ELEMENT 1 Straight 2 Curve 3 Spiral 4 Spiral Curve

CONT

Select the type of element to be inserted.

CONT(F1)

The subsequent input panel depends on the selected element. For a definition of the input panels please refer to chapter "Creating a Horizontal Alignment". Manually make the desired edits.

CONT (F1)

Panel HORIZ ALN\ ALN????.GSI

where ALN????.GSI is the horizontal alignment file name.

E	ORIZ	ALNN ALNCAT	.GSI ——Element——	_
	Ö.	0.000	Start Pt	
	2	302.280	Curve	
	3	402.280	<u>Straight</u> Curve In	
L				-11
B	ONT IN	EW EDIT DE	EL ICHECK	

The new element is inserted. The changes are stored and all elements of the alignment are shifted by the same amount. Only the coordinates and stations of all following elements are adapted, the other design elements are maintained.

CONT (F1)

57

The GSI file for the horizontal alignment is updated and stored.

General Guide to RoadPlus Editor - 4.0.0en

Panel HORIZ ALN\ ALN????.GSI

where ALN????.GSI is the horizontal alignment file name.

ŀ	IORIZ	ALNN ALNCAT	.GSI	
1	Nr	Station-	——Element——	
	0	0.000	Start Pt	
	1	3.381	Straight	
	2	302.280	Curve	
	3	398.280	Curve In	
	4	579.283	Curve	

CONT NEW EDIT DEL CHECK

Move the focus bar to the element to be deleted. The start point is the only point which cannot be deleted.

DEL (F4)



ABORT

OK (F5)

The selected element will be deleted. The coordinates and stations of all other elements are updapted. The remaining design elements are maintained.

ΟK

Panel HORIZ ALN\ ALN????.GSI

where ALN????.GSI is the horizontal alignment file name.

F	IORIZ	ALNN ALNCAT	.GSI
	Nr	Station-	—Element—
	0	0.000	Start Pt
	1	3.381	Straight
	2	99.381	Curve In
	3	280.384	Curve

CONT NEW EDIT DEL CHECK

In the list of elements all stations are updated.

CONT (F1)

The GSI file for the horizontal alignment is updated and stored.

Copying a Horizontal Alignment

Panel RoadPlus Editor

RoadPlus Editor

1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

1 Horizontal Alignment

Panel MANAGE\ Horiz. Alignment

MANAGEN Horiz. A	lignment
ALNCAT	PC-Card PC-Card
ALNMOUSE	PC-Card

CONT NEW EDIT DEL COPY

COPY (F5)

The properties of the original file are used and may be edited.

Panel HORIZ ALN\ New

HORIZ ALN\ New Name (ALN) Job ID	
Device Format Units m\ft Dist Dec. :	PC-CARD♥ GSI-16♥ Metre♥ 3
CONT	

Name <ALN> - Enter a 5 digit name. The system automatically adds ALN as prefix and the extension gsi. Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - Options are **Metre** and **US Feet** as units in which all values will be stored in the GSI file. This can differ from the units configured on the sensor for displaying.

Dist Dec. - Set the number of decimals used for the distance. **Angle Dec.** - Set the number of decimals used for the angle.

CONT (F1) copies the file and leaves the current panel.

The Vertical Alignment

The Vertical Alignment component of the application program RoadPlus Editor allows the creation, editing and deleting of the following elements

- Start Point
- Straight (Tangent)
- Parabola
- Curve.

Throughout the whole Vertical Alignment component, **height** and elevation is used for local orthometric height. If no local orthometric height is available, the local ellipsoidal height is used instead.

Managing Vertical Alignments

Panel RoadPlus Editor

RoadPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

2 Vertical Alignment

This accesses the **panel MANAGE\Vertical Alignment** from where vertical alignment files can be created, edited, deleted and copied.

MANAGENVertical	Alignment
-Vertical-PRF-	DC-Cond
PRFDOG	PC-Card
PRFMOUSE	PC-Card

CONT NEW EDIT DEL COPY

CONT (F1) returns to the panel RoadPlus Editor.

NEW (F2) creates a new vertical alignment. See chapter "Creating a Vertical Alignment".

Creating a Vertical Alignment

EDIT (F3) edits a vertical alignment file. See chapter "Editing a Vertical Alignment".

DEL (F4) deletes a vertical alignment file.

COPY (F5) copies a vertical alignment file. See chapter "Copying a Vertical Alignment".

Panel RoadPlus Editor

RoadPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment

5 Station Equation

CONT CONF

2 Vertical Alignment

Panel MANAGE\Vertical Alignment

MANAGENVertical	Alignment
PRFDOG PRFDOG	PC-Card PC-Card PC-Card

CONT NEW EDIT DEL COPY

NEW (F2)

Panel VERTICAL ALN\ New

VERTICAL ALNN NG	ew
Name (PRF):	Brmei
Job ID :	998
Device	PC-CARD ▼
Format	GSI-16▼
Units m\ft	Metre▼
Dist Dec.	3
CONT	

Name <PRF> - Enter a 5 digit name. The system automatically adds PRF as prefix and the extension gsi. Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - Options are **Metre** and **US Feet** as units in which all values will be stored in the GSI file. This can differ from the units configured on the sensor for displaying.

Dist Dec. - Set the number of decimals used for the distance. **Angle Dec.** - Set the number of decimals used for the angle.

CONT (F1)

Panel INSERT ELEMENT\ Start Point

INSERT ELEMENTN	Start Point
Start Stn :	100.000 m
Elevation :	410.308 m

CONT GETPT

Start Stn - Enter the start station for the vertical alignment. **Elevation** - Enter the height for the start station. Alternatively, press **GetPt (F2)** when the focus is on the Elevation line to select the height from an existing point in the database.

Point\ <	>
_r Point Id ———	—Time -Date -
CAMEL1	17 04 28.04
CAMEL2	17:04 28.04
CAMELS	17:05 28.04
CAMEL4	17:06 28.04
CAMELS	17:06 28.04
	———U.
	បិ
CONT NEW EDIT	DEL INFO ANUM

Highlight the point to be selected.

CONT (F1)

CONT (F1)

Panel VERTICAL ALN\ PRF????.GSI

Select the type of element to be created and press CONT(F1).

where PRF????.GSI is the vertical alignment file name.

VERTICAL	ALNN PRE	CAMEL.GSI	
Nr	-Station-	——Element——	1
0	100.000	Start Pt	

CONT NEW EDIT DEL

The recently created element of the vertical alignment is displayed. The list shows the element number, the end station in the units defined for display through the CONFIG key and the type of element. New elements are always inserted after the highlighted element.

NEW (F2) brings you to the INSERT ELEMENT menu.

Ιŀ	ISERT ELEMENT
1	Straight
2	Parabōla
з	Curve

CONT

Straight

This function enables you to define a straight for the vertical alignment.

ELEMENT\ Str	aight		
Start Stn	:	100.000	m
Start Elev	:	410.308	m
Length	:	100.000	m
Grade	:	-5.000	X –
End Stn	:	200.000	m
End Elev	:	405.308	M

CONT GETPT

Start Stn - The end station of the previous element is automatically used and cannot be edited.

Start Elev - The end height of the previous element is automatically used and cannot be edited.

Length - Length of the straight element as slope distance.

Grade - The grade of the straight element in percentage.

Positive inclines have positive values, negative inclines have negative values.

End Stn - Station at the end of the element.

End Elev - Height at the end of the element. Type in manually or, alternatively, press **GetPt (F2)** when the focus is on this line to select the height from an existing point in the database.

When enough design elements are available, then the remaining design elements are calculated. For example: Values for the Start Stn, Start Elev, Length and Grade have been entered, then End Stn and the End Elev are calculated automatically.

CONT (F1)

VERTICA	L ALNN PRF	CAMEL.GSI	
Nr	-Station-	—_Element—	7
0	100.000	Start Pt	
1	200.000	straight	┛│

CONT NEW EDIT DEL

The straight element is added to the list of elements of the vertical alignment.

Parabola

This function enables you to define a parabola element for the vertical alignment.

	_	-	
ELEMENT\ Par	abol	1a	
Start Elev	:	405.308 m	Г
Grade In (%)		-5.000 %	
Grade Out(%)		0.000 %	
Length	:	200.000 m	
Parāmeter	:	4000.000	
End Stn	:	400.000 m	
End Elev	: -	400.308 m	
CONT GETPT			

Start Stn - The end station of the previous element is automatically used and cannot be edited.

Start Elev - The end height of the previous element is automatically used and cannot be edited.

Grade In <%> - The grade at the beginning of the parabola in percentage. Positive inclines have positive values, negative inclines have negative values.

Grade Out <%> - The grade at the end of the parabola in percentage. Positive inclines have positive values, negative inclines have negative values.

Length - Length of the parabola as horizontal distance.

Parameter - Parameter of the parabola (for sign conventions see chapter "Design Elements - The Vertical Alignment").

End Stn - Station at the end of the element.

End Elev - Height at the end of the element. Edit the element as required or, alternatively, press **GetPt (F2)** when the focus is on this line to select the height from an existing point in the database.

When enough design elements are available, then the remaining design elements are calculated. For example: Values for the Start Stn, Start Elev, Grade In, Grade Out and Length entered, then the Parameter, End Stn and End Elev are calculated automatically.

CONT (F1)

VERT	ICAL	. ALNN PRF	FCAMEL.GSI
-Nr		-Station-	Element
- e	,	100.000	Start Pt
1	L	200.000	Straight
2	2	400.000	Parabola

CONT NEW |EDIT |DEL

The parabola element is added to the list of elements.

Curve

This function enables you to define a curve for the vertical alignment.

ELEMENTN Curve	2
Start Stn :	400.000 m
Start Elev :	400.308 m
Curve Direct:	UNDER
Radius :	10000.000 m
End Stn :	1000.000 m
End Elev :	415.000 m
Grade Out(%):	5.455 %
CONT GETPT	

Start Stn - The end station of the previous element is automatically used and cannot be edited.

Start Elev - The end height of the previous element is automatically used and cannot be edited.

Curve Direct - Looking in the direction of the vertical alignment, the curvature of the curve can be **OVER** or **UNDER** the alignment (see chapter "Design Elements - The Vertical Alignment").

Radius - Radius of the curve. The signs are set automatically in the GSI file depending on the curve direction defined in **Curve Direct** (for sign conventions see chapter "Design

Elements - The Vertical Alignment").

End Stn - Station at the end of the element.

End Elev - Height at the end of the element. Edit the element as required or, alternatively, press **GetPt (F2)** when the focus is on this line to select the height from an existing point in the database.

Grade Out <%> - The grade at the end of the curve in percentage. The calculation of the grade is based on the values for the preceding design elements and cannot be changed.

CONT (F1)

Ļ,	/ERTIC	AL ALNN PRF	CAMEL.GSI
	–Nr.–	Station-	Element
	0	100.000	Start Pt
	1	200.000	Straight
	2	400.000	Parabola
	3	1000.000	Curve

CONT NEW EDIT DEL

The curve element is added to the list of elements of the vertical alignment.

From the list of elements of the vertical alignment, an element can be highlighted and then edited with **EDIT (F3)** or deleted with **DEL (F4)**. Please refer to chapter "Editing a Vertical Alignment" for more information.

VERTIC	AL ALNN PRF	CAMEL.GSI	
	Station-	Element	
0	100.000	Start Pt	
1	200.000	Straight	
2	400.000	<u>Parabola</u>	
3	1000.000	Curve	

CONT NEW EDIT DEL

CONT (F1)

The GSI file for the vertical alignment is created and stored.

Editing a Vertical Alignment

Editing an Existing Element in a Vertical Alignment

Panel RoadPlus Editor

RoadPlus Editor

- 1 Horizontal Alignment
- 2 Vertical Alignment 3 Cross Section
- 4 Cross Section Assignment
- 5 Station Equation

CONT CONF

2 Vertical Alignment

Panel MANAGE\Vertical Alignment

MANAGENVertical Alignment Vertical-PRF PC-Card PRFCAT PC-Card PRFDOG PC-Card PRFMOUSE PC-Card

CONT NEW EDIT DEL COPY

Move the focus bar to the vertical alignment file to be edited.

EDIT (F3)

This leads to **panel VERTICAL ALN\PRF????.GSI**. From this panel, elements can be edited, inserted and deleted.

Panel VERTICAL ALN\ PRF????.GSI

where PRF????.GSI is the vertical alignment file name.

VERTICE	IL ALNN PRF	CAT.GSI
Nr	Station-	—_Element—
0	100.000	<u>Start Pt</u>
		straight
<u>~</u>	400.000	Parabola

CONT NEW EDIT DEL

Move the focus bar to the element to be edited. The start point is the only uneditable point of a vertical alignment.

EDIT (F3)

The subsequent input panel depends on the selection. For a definition of the input panels please refer to chapter "Creating a Vertical Alignment". Edit the element as required.

CONT (F1)

INSERT ELEMENT' Confirmation

Confirmation You have moved a coordinate in the alignment. Do you want to shift the rest of the alignment (YES) or the next element only (NO)

ABORT NO YES

The Vertical Alignment

ABORT (F1) does not save the changes.

YES (F3) stores the changes and shifts all elements of the alignment by the same amount. The elevations and stations are updated, all other values are maintained.



NO (F5) stores the changes and recalculates the start station, the start elevation and values of the following element only. The elevations, stations and values of all other design elements are maintained.

Panel VERTICAL ALN\ PRF????.GSI

where PRF????.GSI is the vertical alignment file name.

VERTICE	IL ALNN PRFI	CAT.GSI
Nr	Station-	——Element——
0	100.000	Start Pt
1	250.000	Straight
2	400.000	Parabola

CONT NEW EDIT DEL

In the list of elements all stations are updated.

CONT (F1)

The GSI file for the vertical alignment is updated and stored.



Inserting an Element in a Vertical Alignment

Panel VERTICAL ALN\ PRF????.GSI

where PRF????.GSI is the vertical alignment file name.

VERTICAL ALNN PRFCAT.GSI		
Station-	——Element——	•
100.000	Start Pt	
200.000	Straight	
400.000	Parabola	
	AL ALNN PRF Station- 100.000 200.000 400.000	AL ALNN PRFCAT.GSI Station Element 100.000 Start Pt 200.000 Staright 400.000 Parabola

The subsequent input panel depends on the selected element. For a definition of the input panels please refer to chapter "Creating a Vertical Alignment". Edit the element as required.

CONT (F1)

Panel VERTICAL ALN\ PRF????.GSI

where PRF????.GSI is the vertical alignment file name.

VERTICAL ALNN PRFCAT.GSI			
1	–Nr .—	Station-	——Element——
	0	100.000	Start Pt
	1	200.000	Straight
	2	700.000	Curve
	3	900.000	Parabola

CONT NEW EDIT DEL

The new element is inserted. The changes are stored and all elements of the alignment are shifted by the same amount. Only the elevations and stations of all following elements are adapted, the other design elements are maintained.

CONT (F1)

The GSI file for the vertical alignment is updated and stored.

Elements are always inserted **after** the one highlighted. No element can be inserted before the starting point. Move the focus bar to the equivalent position.

NEW (F2)

Panel INSERT ELEMENT

CONT NEW EDIT DEL

I	NSERT ELEMENT
1	Straight
2	Parabola
з	Curve

CONT

Select the type of element to be inserted.

CONT(F1)

The Vertical Alignment

Deleting an Existing Element in a Vertical Alignment

Panel VERTICAL ALN\ PRF????.GSI

where PRF????.GSI is the vertical alignment file name.

VERTICAL ALNN PRFCAT.GSI				
I	–Nr .—	Station-	——Element—	7
		100.000	<u>Start Pt</u>	
	1	200.000	Straight	1
	2	400.000	Parabola	
l				

Panel VERTICAL ALN\ PRF????.GSI

where PRF????.GSI is the vertical alignment file name.

VERTICAL ALNN PRECAT.GSI			
0	100.000	Start Pt	
1	300.000	Parabola	
CONT INF			

CONT NEW EDIT DEL

Move the focus bar to the element to be deleted. The start point is the only point which cannot be deleted.

DEL (F4)

VERTICAL ALNN PRFCAT.GS	
Element will be delete	ed i
The alignment will be adjusted.	

ABORT

OK (F5)

The selected element will be deleted. The elevations and stations of all other elements are updapted. The remaining design elements are maintained.

ΟK

In the list of the elements all stations are updated.

CONT (F1)

The GSI file for the vertical alignment is updated and stored.

Copying a Vertical Alignment

Panel RoadPlus Editor

RoadPlus Editor

- 1 Horizontal Alignment
- 2 Vertical Alignment 3 Cross Section
- 4 Cross Section Assignment
- 5 Station Equation

CONT CONF

2 Vertical Alignment

Panel MANAGE\Vertical Alignment

MANAGE Vertical Alignment Vertical-PRF PRFCAT PC-Card PRFDOG PC-Card PRFMOUSE PC-Card CONT NEW EDIT DEL COPY

COPY (F5)

The properties of the original file are used and may be edited.

Panel VERTICAL ALN\ New

VERTICAL ALNN New Name (PRF): Job ID :	
Device Format Units m\ft: Dist Dec. :	PC-CARD▼ GSI-16▼ Metre▼ 3
CONT	

Name <PRF> - Enter a 5 digit name. The system automatically adds PRF as prefix and the extension gsi. Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - Options are **Metre** and **US Feet** as units in which all values will be stored in the GSI file. This can differ from the units configured on the sensor for displaying.

Dist Dec. - Set the number of decimals used for the distance. **Angle Dec.** - Set the number of decimals used for the angle.

CONT (F1) copies the file and leaves the current panel.
The Cross Section

The Cross Section component of the application program RoadPlus Editor allows the creation, editing and deleting of the following elements

- Point
- Straight

of individual cross section templates.

Several cross section templates for one particular RoadPlus Application can be kept together in one cross section file.

Managing Cross Sections

Panel RoadPlus Editor

ROSCIPIUS Editor 1 Horizontal Alignment 2 Vertical Alignment 8 Gross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

3 Cross Section

This accesses the **panel MANAGE**\ **Cross Sections** from where cross section files can be created, edited, deleted and copied.

MANAGEN Cross Sect	tions
-Cross-Sections-	PC-Card
	PC-Card
CHSHOOSE	FC-Card

CONT NEW EDIT DEL COPY

CONT (F1) returns to the panel RoadPlus Editor.

NEW (F2) creates a new cross section file. See chapter "Creating a Cross Section".

Creating a Cross Section

EDIT (F3) edits a cross section file. See chapter "Editing a Cross Section".

DEL (F4) deletes a cross section file.

COPY (F5) copies a cross section file. See chapter "Copying a Cross Section".

Panel RoadPlus Editor

ReadPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 8 Gross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

3 Cross Section

Panel MANAGE\ Cross Sections

MANAGEN Cross Sec Cross-Sections-	tions
CRSDOG CRSDOG CRSMOUSE	PC-Card PC-Card PC-Card

CONT NEW EDIT DEL COPY

NEW (F2)

Panel CROSS SEC\ New

CROSS SECN New Name (CRS): Job ID	CAMEL 998
Device Format Units m\ft: Dist Dec. :	PC-CARD♥ GSI-16♥ Metre♥ 3
CONT	

Name <CRS> - Enter a 5 digit name. The system automatically adds CRS as prefix and the extension gsi. Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - Options are **Metre** and **US Feet** as units in which all values will be stored in the GSI file. This can differ from the units configured on the sensor for displaying.

Dist Dec. - Set the number of decimals used for the distance.

Panel CROSS SEC\ CRS????.GSI

where CRS????.GSI is the cross section file name.



CONT NEW EDIT DEL PLOT

In this panel, all cross section templates contained in the cross section file are listed. Since no template exists yet, the list is empty.

Press NEW (F2) to create a new template.

Panel TEMPLATE\

TEMPLATEN Templ Name : CUT/FILL :	NOWHERE1 FILL V
L.End Slp(%):	2.000%
R.End Slp(%):	-2.000%

CONT

Templ Name - Enter a name for the new cross section template.

CUT/FILL - This is an information field for the user. The information is saved in the GSI file. Select **NONE** when no extra information is desired.

CUT is a cross section with the hinge point being below the existing surface of the ground.



FILL is a cross section with the hinge point being above the existing surface of the ground.



L.End Slp <%> - A slope at the leftmost point of the cross section can be defined in percent. If the design surface is falling to the left, the slope is a positive value (see chapter "Design Elements").

R.End Slp <%> - A slope at the rightmost point of the cross section can be defined in percent. If the design surface is rising to the right, the slope is a positive value (see chapter "Design Elements").

CONT (F1)

Panel Template\ ???

where ??? is the template name.

In this panel, all segments describing the cross section template are listed. Since no segments exist yet, the list is empty. The units are as defined for display through the CONFIG key.



The Cross Section

Press NEW (F2) to create a segment.

Panel Segment\ ???

where ??? is the template name.



ABCDE|FGHIJ|KLMNO|PQRST|UVWXY|Z[N]

For entering the segment information, select between method **Delta Dist CL** and **Cross Slp<%>**. Depending on the selected method, the input fields change. Both methods are described in the following section.

Delta Dist CL

By this method, a new point is added to the cross section template. The point is defined by its horizontal and vertical distance from the centre line.

4.000 m Left♥ 0.100 m

Up/Down CL - Up is to be selected for a point above the
centre line. Down is to be selected for a point below the
centre line.

CONT (F1)

DISTICL :	
Lft/Rght C:	
Delta Hot :	
UÞ/Down CL:	

SEGMENTN NOWHERE1

.

CONT

Method

Method - In this case, Delta Dist CL is selected.

Delta Dist CL

DIST CL - The horizontal distance from the centre line. Only positive values are accepted. The plus or minus sign in front of this value in the GSI file is determined by the selection field **Lft/Rght C**.

Lft/Rght C - Left is to be selected for a point left from the centre line. Right is to be selected for a point right from the centre line.

Delta Hgt - Here, the vertical height difference between the centre line and the point needs to be entered. Only positive values are accepted. The plus or minus sign in front of this value in the GSI file is determined by the selection field **Up/ Down CL**.

Cross Slp<%>

CONT

By this method, a new point is added to the cross section template. The point is defined by a horizontal distance, also called segment length, and a slope from a reference point. Usually, this reference point has been defined before as a point in the cross section template. If the overall first point of a cross section template is defined by this method, the centre line is the reference point. **Slope** <%> - The slope of the segment from the end of the previous segment, not from the centre line. Only positive values are accepted. The plus or minus sign in front of this value in the GSI file is determined by the selection field **Up**/**Down**.

Up/Down - If the new segment goes up from the end of the previous segment, select **Up**. Otherwise select **Down**.

SEGMENTN NO	WHERE1	
Method :	Cross	S1p(%)▼
SEG Length:		4.000 m
Left/Right:		Right♥
Slope (%) :		2.500%
Up/Down :		Up♥

Method - In this case, Cross SIp<%> is selected.

SEG Length - The horizontal length of the segment. Only positive values are accepted. The plus or minus sign in front of this value in the GSI file is determined by the selection field **Left/Right**.

Left/Right - Left is to be selected for a segment at the left end of the cross section. Right is to be selected for a segment at the right end of the cross section.

CONT (F1)



The segment information entered with this method is converted into horizontal and vertical distance from the centre line. It is then stored as method Delta Dist CL.

Panel Template\ ???

where ??? is the template name.

Template\ NOWHE	RE1	
L- 10 000	- 5 000	
- 4.000	- 0.100	
+ 4.000	+ 0.100	
. 10.000	0.000	
		ĥ
CONT NEW EDIT	DEL SL/DH	

SL/DH (F5) changes the display to show segment length and the slope in percent.

Temp	∘late∖ N	OWHERE1		
Se	egment—L(ength——:	Slope(%)-	_
-	6.000	-	81.667	
-	4.000	-	2.500	
	-zero			
+	4.000	+	Z 500	
+	6.000	+	81.667	
				 0
CONT	Г		SL/DH	

SL/DH (F5) to change back to the former display.

Independant of the method selected, the points are added to a list of segments. The order in the list is from the leftmost point to the centre line to the rightmost point. Any new point is added according to this order.

The list shows the horizontal and vertical centre line offset. For sign conventions see chapter "Design Elements".

There, press **Shift + PLOT (F5)** to see a graphical presentation of the cross section template. **CONT (F1)**.

From the list of segments of the cross section template, an element can be highlighted and then edited with **EDIT (F3)** or deleted with **DEL (F4)**. Please refer to chapter "Editing a Cross Section" for more information.

CONT (F1) returns to panel CROSS SEC\ CRS????.GSI

where CRS????.GSI is the cross section file name.

CROSS SECN	CRSCAMEL.GSI	
NOWHERE1	PC-Card	

CONT NEW EDIT DEL PLOT

The created cross section template is added to the list.

CONT (F1)

The GSI file for the cross section is created and stored.

Editing a Cross Section

Panel RoadPlus Editor

RoadPlus Editor

1 Horizontal Alignment 2 Vertical Alignment **3 Cross Section** 4 Cross Section Assignment 5 Station Equation

CONT CONF

3 Cross Section

Panel MANAGE\ Cross Sections

MANAGEN Cross Sed	tions
<u>Cross-Sections-</u>	
	<u>PC-Cand</u> DC-Cand
CRSMOUSE	PC-Card
1	

CONT NEW EDIT DEL COPY

Move the focus bar to the cross section file to be edited.

EDIT (F3)

This leads to **panel CROSS SEC****CRS????.GSI**, from where all cross section templates contained in the cross section file can be edited, deleted and graphically displayed or a new template can be created.

The Cross Section

Editing an Existing Cross Section Template

Panel CROSS SEC\ CRS????.GSI

where CRS????.GSI is the cross section file name.

CROSS SECN CRSCA	T.GSI
RP000123	PC-Card PC-Card
&P000124	PC Cal U

CONT NEW EDIT DEL PLOT

Move the focus bar to the cross section template to be edited.

EDIT (F3)

Panel TEMPLATE

TEMPLATEN Templ Name : CUT/FILL :	QP000123 None▼
L.End Slp(%):	0.000%
R.End Slp(%):	0.000%

CONT

All fields can be edited. For a description of the input fields see "Creating a Cross Section".

This leads to panel Template\ ???, from where all segments of the cross section file can be edited and deleted or a new segment can be created.

Editing a Segment in an Existing Cross Section Template

Panel Template\ ???

where ??? is the template name.

Template\ QP0001	23		
-CL-Offset	—_De:	lta-Hgt	
- 10.000	_	5.000	Ш
- 4.000	-	0.100	Ш
+ 4.000 + 10.000	+	0.100	Ш
. 10.000		0.000	
			<u> </u>
CONTINEW EDITI	ΠEI	ISLZTH	_

Move the focus bar to the segment to be edited.

EDIT (F3)

Panel Segment\??? where ??? is the template name.

SEGMENTN QP0	000123
Method :	Delta Dist CL
DIST CL :	13.000 m
Lft/Rght C:	Left♥
Delta Hgt :	3.000 m
Up/Down CL:	Down♥
CONT	

Since all entries previously entered using the Cross Slp<%> method are converted into Delta Dist CL, only method Delta Dist CL is shown and not changable.

Edit the element as required. For a definition of the input fields please refer to chapter "Creating a Cross Section".

CONT (F1)

Panel Template\???

where ??? is the template name.

Template\ QP0001	23		
-CL-Offset	—Del	lta-Hgt	1
- 13.000	-	3.000	
- 4.000		0.100	
+ 4.000	+	0.100	
+ 10.000	-	6.000	
+ 13.000	-	3.500	
•			۰,
			í
CONT INEW [EDIT]	DEL	SL/DH	

The list of segments of the cross section template is updated.

CONT (F1) leads back to **panel CROSS SEC\CRS????.GSI** where CRS????.GSI is the cross section file name.

To store the changes in the GSI file press CONT (F1).

The Cross Section

Inserting a Segment into an Existing Cross Section Template

Panel Template\ ??? where ??? is the template name.

Template∖	QP000123	
-CL-Offse	tDelta	∋-Hgt
- 13.000	- 3	.000
- 10.000	- 5	.000
- 4.000	- ē	.100
+ 4.000	+ ē	.100
+ 10.000	- 6	.000
		,
CUNTINEM	IENII NEL 18	L/DH

If the new segment information to be entered is to be input as a horizontal and vertical distance from the centre line, the position of the focus bar is irrelevant. The method to be chosen in the next panel is **Delta Dist CL**.

If the new segment information is to be input as horizontal distance (segment length) and slope<%> from an existing segment in the cross section template, the focus bar must be positioned on this segment. The method to be chosen in the next panel is **Cross Slp<%>**.

Panel Segment\ ??? where ??? is the template name.

SEGMENTN QP0	00123
Method :	Delta Dist CL
DIST CL :	5.000 m
Lft/Rght C:	Right♥
Delta Hgt :	0.500 m
Up/Down CL:	Down♥

CONT

Enter the values for the new segment. For a definition of the input fields please refer to chapter "Creating a Cross Section".

CONT (F1)

continued ...

NEW (F2)



Panel Template\ ??? where ??? is the template name.

Template∖ QP0001	.23
CL-Offset	—_Delta_Hgt—
- 10.000	- 5.000
- 4.000	- 0.100
+ 4.000	+ 0.100
1 31000	0.300
	<u> </u>
CONTINEW LEDITI	DEL ISL/DH

The list of segments of the cross section template is updated.

CONT (F1) leads back to **panel CROSS SEC\CRS????.GSI** where CRS????.GSI is the cross section file name.

To store the changes in the GSI file press CONT (F1).

Deleting a Segment in an Existing Cross Section Template

Panel Template\ ???

where ??? is the template name.

Template\ QP0001	23	
-CL-Offset	— Delta-Hgt—	-0
- 18.000	- 5.000	
- 4.000	- 0.100	11
+ 4.000	+ 0.100	Ш
+ 10.000	- 6.000	
		ш _о
CONT NEW EDIT	DEL SL/DH	Ĭ

Move the focus bar to the segment to be deleted.

DEL (F4)



General Guide to RoadPlus Editor - 4.0.0en

Panel Template\ ???

where ??? is the template name.

Template\ QP000:	.23		
CL_Offset	—Del	lta_Hgt	1
- 13.000	-	3.000	
- 4.000		0.100	
+ 10 000		6.000	
+ 13.000	-	3.500	
			· .
			<u>û</u>
CONT NEW EDIT	DEL	SL/DH	

The list of segments of the cross section template is updated. The values for CL Offset and Delta Hgt are maintained. The values for Segment Length and Slope<%> which can be viewed with **SL/DH (F5)**, are recomputed and updated accordingly.

CONT (F1) leads back to **panel CROSS SEC\ CRS????.GSI** where CRS????.GSI is the cross section file name.

To store the changes in the GSI file press CONT (F1).

Inserting a New Cross Section Template

Panel CROSS SEC\ CRS????.GSI

where CRS????.GSI is the cross section file name.

CROSS SECN CR	SCAT.GSI
RP000123	PC-Card
QP000124	PC-Card

CONT NEW EDIT DEL PLOT

Press **NEW (F2)** and follow the instructions in chapter "Creating a Cross Section".

Deleting an Existing Cross Section Template

Panel CROSS SEC\ CRS????.GSI

where CRS????.GSI is the cross section file name.

CROSS SECN	CRSCAT.GSI		
RP000123		PC-Card	
UP000124		PC-Card	

CONT NEW EDIT DEL PLOT

Move the focus bar to the cross section template to be deleted.

DEL (F4)



OK (F5)

The selected cross section template will be deleted.

Copying a Cross Section

Panel CROSS SEC\ CRS????.GSI

where CRS????.GSI is the cross section file name.

CROSS SECN	CRSCAT.GSI		
RP000124		PC-Card	

CONT NEW EDIT DEL PLOT

The list of the cross section templates is updated.

CONT (F1)

The GSI file for the cross section is updated and stored.

Panel RoadPlus Editor

RoadPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 8 Gross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

3 Cross Section

Panel MANAGE\ Cross Sections

MANAGE\ Cross Se	ections
-Cross-Sections	·
CRSCAT	PC-Card
CRSDOG	PC-Card
CRSMOUSE	PC-Card

CONT NEW EDIT DEL COPY

Move the focus bar to the cross section file to be copied.

COPY (F5)

The properties of the original file are used and may be edited.

Panel CROSS SEC\ New

CROSS SECN New Name (CRS): Job ID	
Device Format Units m\ft: Dist Dec. :	PC-CARD♥ GSI-16♥ Metre♥ 3
CONT	

Name <CRS> - Enter a 5 digit name. The system automatically adds CRS as prefix and the extension gsi. Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - Options are **Metre** and **US Feet** as units in which all values will be stored in the GSI file. This can differ from the units configured on the sensor for displaying.

Dist Dec. - Set the number of decimals used for the distance.

CONT (F1) copies the file and leaves the current panel.

The Cross Section Assignment

The Cross Section Assignment component of the application program RoadPlus Editor allows the creation, editing and deleting of

• cross section assignments.

A cross section assignment defines from which station on a cross section is to be used.

Managing Cross Section Assignment Files

Panel RoadPlus Editor

RoadPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

4 Cross Section Assignment

This accesses the **panel MANAGE**\ **X-Sec Assn.** from where cross section assignment files can be created, edited, deleted and copied.

MANAGE\X-Sec Assn.	
Cross-Section-Assn.	
STADOG	PC-Card
STACAT	PC-Card

CONT NEW EDIT DEL COPY

CONT (F1) returns to the panel RoadPlus Editor.

NEW (F2) creates a new cross section assignment file. See chapter "Creating a Cross Section Assignment File".

Creating a Cross Section Assignment File

EDIT (F3) edits a cross section assignment file. See chapter "Editing a Cross Section Assignment File".

DEL (F4) deletes a cross section assignment file.

COPY (F5) copies a cross section assignment file. See chapter "Copying a Cross Section Assignment File".

Panel RoadPlus Editor

RoadPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

4 Cross Section Assignment

Panel MANAGE\ X-Sec Assn.

C-Card
C-Card
C-Card

CONT NEW EDIT DEL COPY

NEW (F2)

Panel X-SEC ASSN\ New

X-SEC ASSNY	< New	
Name (STA):		CAMEL
Job ID :		998
X-Sec File:		CRSCAMEL
Device :		PC-CARD▼
Format :		GSI-16♥
Units m\ft:		Metre
Dist Dec. :		3
CONT		UTEW

Name <STA> - Enter a 5 digit name. The system automatically adds STA as prefix and the extension gsi. Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

X-Sec File - From the listbox, select the cross section file containing the cross sections to be assigned. When the focus is on this line, the button VIEW (F5) becomes available. This button displays the templates of the selected cross section file. From the display panel, CONT (F1) returns to panel X-SEC ASSN\ New.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - Options are **Metre** and **US Feet** as units in which all values will be stored in the GSI file. This can differ from the units configured on the sensor for displaying.

Dist Dec. - Set the number of decimals used for the distance.

CONT (F1)

Panel X-SEC ASSN\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.



In this panel, all cross section assignments contained in the cross section assignment file are listed. Since no assignment exists yet, the list is empty. The units are as defined for display through the CONFIG key.

Press NEW (F2) to create a new assignment.

Panel ELEMENT\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.

ELEMENTN Station	STACAM :	EL.GSI 88.500 m
Template	:	NOWHERE1 -

Panel X-SEC ASSN\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.



Station - Type in the station from where the cross section element is to be used.

Template - From the listbox, select a cross section template you want to assign to the station.

CONT (F1)

CONT

The assignment is added to the list. Assignments are listed with increasing station.

From the list of cross section assignments, an assignment can be highlighted and then edited with **EDIT (F3)** or deleted with **DEL (F4)**. Please refer to chapter "Editing a Cross Section Assignment File" for more information.

CONT (F1)

The GSI file for the cross section assignment is created and stored.

Editing a Cross Section Assignment File

Panel RoadPlus Editor

RoadPlus Editor

1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

4 Cross Section Assignment

Panel MANAGE\ X-Sec Assn.

MANAGE\X-Sec Assn.	
-Cross-Section-Ass	sn.—
STADGAT	PC—Card
STADOG	PC—Card
STAMOUSE	PC—Card

CONT NEW EDIT DEL COPY

Move the focus bar to the cross section assignment file to be edited.

EDIT (F3)

This leads to **panel X-SEC ASSN\ STA????.GSI**, from where all cross section assignments contained in the cross section assignment file can be edited and deleted or a new assignment can be created.

General Guide to RoadPlus Editor - 4.0.0en

Editing an Existing Cross Section Assignment

Panel X-SEC ASSN\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.

X-SEC ASSNN	STACAT.GSI	
Template_	Station	
QP000124	50.000	
QP000123	250.553	
QP000124	350.000	
QP000123	500.000	
QP000124	600.000	
		Û
CONT NEW 1		Û

Move the focus bar to the cross section assignment to be edited.

EDIT (F3)

Panel ELEMENT\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.

ELEMENTN	STR	CAT.GSI
Station	:	50.000 m
Template	:	QP000124₹

CONT

Either change the station from where the cross section template will be effective or select another template. **CONT (F1)**

Panel X-SEC ASSN\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.

X-SEC ASSNN	STACAT.GSI	
Template	Station	
QP000124	100.000	
QP000123	250.553	
QP000124	350.000	
QP000123	500.000	
QP000124	600.000	
		Û.
CONT NEW E	DIT DEL	

The list of cross section assignments is updated.

To store the changes in the GSI file press CONT (F1).

The Cross Section Assignment

Inserting a New Cross Section Assignment

Panel X-SEC ASSN\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.

X-SEC ASSNN	STACAT.GSI	
QP000124	50.000	
QP000123	250.553 350.000	
QP000123	500.000	
QP000124	600.000	
CONT NEW 1		Û

Press **NEW (F2)** and follow the instructions in chapter "Creating a Cross Section Assignment File".

Deleting an Existing Cross Section Assignment

Panel X-SEC ASSN\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.

X-SEC ASSNN	STACAT.GSI	
Template	Station	
QP000124	50.000	
QP000123	250.553	
QP000124	350.000	
QP000123	500.000	
QP000124	600.000	
		Û.
CONT NEW E	DIT DEL	

Move the focus bar to the cross section assignment to be deleted.

DEL (F4)



OK (F5)

The selected cross section assignment will be deleted.

Copying a Cross Section Assignment File

Panel X-SEC ASSN\ STA????.GSI

where STA????.GSI is the name of the cross section assignment file.

X=SEC ASSN Template- 02000123 02000124 02000123 02000124	STACAT.GSI 	
CONT NEW E	DIT DEL	Û

Panel RoadPlus Editor

RosdPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

4 Cross Section Assignment

The list of the cross section assignments is updated.

CONT (F1)

The GSI file for the cross section is updated and stored.

Panel MANAGE\ X-Sec Assn.

MANAGE\X-Sec A:	ssn.
-Cross-Section	1-Assn
STACAT	PC-Card
STADOG	PC-Card
STAMOUSE	PC-Card

CONT NEW EDIT DEL COPY

Move the focus bar to the cross section assignment file to be copied.

COPY (F5)

The properties of the original file are used and may be edited.

Panel X-SEC ASSN\ New

X-SEC ASSN'	New			
Name (STA):			COP'	N .
JOB ID 🔅			998	8
X-Sec File:			CA1	т
Device :		P	C-CARI	D▼
Format :		1	GSI-10	6₹
Units m\ft;			Metro	e
Dist Dec. :			;	3
CONT				

Name <STA> - Enter a 5 digit name. The system automatically adds STA as prefix and the extension gsi. Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

X-Sec File - The cross section file selected originally. This cannot be changed.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - Options are **Metre** and **US Feet** as units in which all values will be stored in the GSI file. This can differ from the units configured on the sensor for displaying.

Dist Dec. - Set the number of decimals used for the distance.

CONT (F1) copies the file and leaves the current panel.

The Station Equation

The Station Equation component of the application program RoadPlus Editor allows the creation, editing and deleting of the following elements

- station ahead
- station back.

Managing Station Equations

Panel RoadPlus Editor

RosdPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Eduction

CONT CONF

5 Station Equation

This accesses the **panel MANAGE**\ **Station Eqn.** from where station equation files can be created, edited and deleted.

MANAGEN Station Eqn.	
EQNCAT EQNMOUSE	PC-Card PC-Card PC-Card

CONT NEW EDIT DEL

CONT (F1) returns to the panel RoadPlus Editor.

NEW (F2) creates a new station equation file. See chapter "Creating a Station Equation".

Creating a Station Equation

EDIT (F3) edits a station equation file. See chapter "Editing a Station Equation".

DEL (F4) deletes a station equation file.

Panel RoadPlus Editor

RoscPlus Editor 1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Eguation

CONT CONF

5 Station Equation

Panel MANAGE\ Station Eqn.

MANAGEN Station Eqn.	
EGNICOT	PC-Card
EGNCAT	PC-Card
EGNMOUSE	PC-Card

CONT NEW EDIT DEL

NEW (F2)

Panel STATION EQUATION\ New

STATION EQU	JATION\ New
Name (EQN):	ALNCAT♥
Job ID :	998
Device	BC=CAB 0 L
Format	GSI-16▼
Units m\ft	US Feet
Dist Dec.	3
CONT	

Dist Dec. - The number of decimals used for the distances is used from the horizontal alignment file selected and cannot be changed.

CONT (F1)

Panel STATION EQUATION \ EQN????.GSI

where EQN????.GSI is the name of the station equation file.

Name <EQN> - Select the horizontal alignment file to which the new station equation file will belong. The station equation file will automatically be given the same name as the horizontal alignment file but ALN will be replaced by EQN. Example: The horizontal alignment file ALNCAT.GSI will have a station equation file called EQNCAT.GSI.

Job ID - The Job Indentification can be up to 16 ASCII characters long. It is part of the header of the GSI file. This number informs the system about which GSI files belong together.

Device - Sets the device upon which the job is stored. Note that internal memory is not fitted as standard and therefore may not be an option.

Format - Select between GSI-8 and GSI-16.

Units m\ft - The units in which all values will be stored in the GSI file. The information is read from the horizontal alignment file selected and cannot be changed. These units can differ from the units configured on the sensor for displaying.



In this panel, all station equations contained in the station equation file are listed. Since no equation exists yet, the list is empty. The units are as defined for display through the CONFIG key.

Press NEW (F2) to create a new equation.

Panel STATION EQUATION ELEMENT

STR Str	110N E Ahead	3U):	TION\ Element 522.730	M
STN	Back	:	622.140	m

Panel STATION EQUATION \ EQN????.GSI

where EQN????.GSI is the name of the station equation file.



STN Ahead - Type in the station ahead. **STN Back** - Type in the station back.

CONT (F1)

CONT

The equation is added to the list. Several equations in the list are listed with increasing station ahead.

From the list of station equations, an equation can be highlighted and then edited with **EDIT (F3)** or deleted with **DEL (F4)**. Please refer to chapter "Editing a Station Equation" for more information.

CONT (F1)

The GSI file for the station equation file is created and stored.

Editing a Station Equation

Panel RoadPlus Editor

RoadPlus Editor

1 Horizontal Alignment 2 Vertical Alignment 3 Cross Section 4 Cross Section Assignment 5 Station Equation

CONT CONF

5 Station Equation

Panel MANAGE\ Station Eqn.

gn.
n PC-Card
PC-Card PC-Card

CONT NEW EDIT DEL

Move the focus bar to the station equation file to be edited.

EDIT (F3)

This leads to panel STATION EQUATION \ EQN????.GSI,

from where all station equations contained in the station equation file can be edited and deleted or a new equation can be created.

The Station Equation

Editing an Existing Station Equation

Panel STATION EQUATION \ EQN????.GSI

where EQN????.GSI is the name of the station equation file.

STATION E0 -STN-Ahea 550.725 550.000 570.000	UATION \ 8 d	ANDOG GSI Stn-Back- 450.725 480.009 470.000	
CONT NEW	EDIT DEL		Û

Move the focus bar to the station equation to be edited.

EDIT (F3)

Panel STATION EQUATION ELEMENT

STAT	TION EG	2UATION	Element	
STN	Ahead	:	560.000	m
STN	Back	:	460.000	m

CONT

Change the station ahead or the station back as required.

CONT (F1)

where EQN????.GSI is the name of the station equation file.

STATION ERU	ATION \	ERNDOG.GSI	
-STN-Ahead	=	-Stn-Back	
550.725	=	450.725	
580.000	=	465.500	
570.000	=	470.000	
CONT NEW	EDIT DEL		Û

The list of station equations is updated.

To store the changes in the GSI file press CONT (F1).

General Guide to RoadPlus Editor - 4.0.0en

Inserting a New Station Equation

Deleting an Existing Station Equation

PanelSTATION EQUATION \ EQN????.GSI

where EQN????.GSI is the name of the station equation file.

2	-STI 550 560 570	10N E 1-Ahe 1725 1999 1000	RUATION ad = = =	N EQNDOG.C Stn-Back 450.72 460.00 470.00	25 29 90
D	ONT:	NEW	EDITI	EL	Û

Press **NEW (F2)** and follow the instructions in chapter "Creating a Station Equation".

PanelSTATION EQUATION \ EQN????.GSI

where EQN????.GSI is the name of the station equation file.

STATION EQU	ATION \	EQNDOG.GSI Stn-Back
550.725	=	450.725
560.000	=	460.000
570.000	=	470.000
		Û
CONT NEW E	DIT DEL	

Move the focus bar to the station equation to be deleted.

DEL (F4)

STATION EQUATION 🚿 EQNDOG.GSI

ABORT OK

OK (F5)

The selected station equation will be deleted.

PanelSTATION EQUATION \ EQN????.GSI

where EQN????.GSI is the name of the station equation file.

8	-STN-Ahead	JATION	N EQ St	NDOG. n—Baci	GSI K——	
	550.725	=		450.7	25 99	
						Û
0	ONT NEW	EDIT I	DEL			

The list of the station equations is updated.

CONT (F1)

The GSI file for the station equation file is updated and stored.

Glossary

Α

Parameter A of a clothoïde. Defined as $A^2 = R \times L (A - para$ meter, R - radius, L - length of portion of curve).

Alignment

A curvilinear line describing the plan or profile view of a project. Horizontal and Vertical Alignments exist.

Backward Station Equation

See overlap equation

Centre Line

The plan view alignment, also called Horizontal Alignment.

Chainage

The cumultative distance along the horizontal alignment, frequently but not always starting at zero. Also called station.

Clothoïde

A horizontal curve with constantly linear increasing curving. Defined by $A^2 = R \times L (A - parameter, R - radius, L - length of portion of curve).$

Cross Section

A profile view of a project at a particular station.

Curve

A horizontal curve of constant radius, e.g. a portion of a circle.

Curve In

A portion of a clothoïde. Spiral transition from larger to smaller radius curve ($R_1 > R_2$ parameter A).

Curve Out

A portion of a clothoïde. Spiral transition from smaller to larger radius curve ($R_1 < R_2$ parameter A).
Curvilinear

A line consisting of any combination of tangents, curves and / or spirals for the horizontal or for the vertical of tangents, curves and / or parabolas.

Cut Slope

The surface of the project in areas of excavation with the design surface below original ground.

Design Surface

The intended shape of the completed project.

Equation

Required for a point on the horizontal alignment where the stationing is discontinuous. Gap equations and overlap equations are distinguished.

Fill Slope

The surface of the project in areas of fill with the design surface above original ground.

Finished Road Level

The level to which the final road is build to.

Forward Station Equation

See gap equation

Gap Equation

A type of station equation handling gaps in the stationing after removing a constituing element and stationing has not been re-computed.

Grade

Rate of change in elevation of the vertical alignment.

Ground Surface

See original ground

Horizontal Alignment

The plan view alignment, also called centre line.



Long Profile

The profile alignment, also called vertical alignment.

Offset

The horizontal or vertical distance from a point to an alignment or cross section.

Original Ground

The undisturbed surface before project construction is started as well as the actual shape of the project at the current stage of construction; also called original surface or ground surface.

Original Surface

See original ground

Overlap Equation

A type of station equation handling overlaps in the stationing after inserting a constituing element and stationing has not been re-computed.

Ρ

Parameter P. This is the reciprocal of the rate of change of grade in the vertical curve. Three formulas for the calculation of P exist (see chapter Vertical Alignment).

Parabola

A parabolic arc. Exists only on vertical alignments.

Profile

See cross section

Spiral

A gradual horizontal transition from a tangent to a curve or two curves of different radii; optional for roads, required for railroads.

Spiral In

A gradual horizontal spiral transition from a tangent to a curve $(R_1 = \infty, R_2 = n, \text{ parameter A}).$

Spiral Out

A gradual horizontal spiral transition from a curve to a tangent ($R_1 = n$, $R_2 = \infty$, parameter A).

Station

The cumultative distance along the horizontal alignment, frequently but not always starting at zero. Also called chainage.

Station Ahead

The stationing to be applied going forward along the alignment from the equation.

Station Back

The stationing to be applied going backwards along the alignment from the equation.

Station Equation

It defines adjustments for the Horizontal Alignment File when consituing elements have been added / removed resulting in a gap or overlap in the stationing without re-computing stationing.

Superelevation

Modification of the normal pavement cross slope. Intended to increase comfort and safety at speed.

Tangent

A straight line connecting two position points (XY) or height points (Z). It touches a circle, curve or spiral in one point and is perpendicular to the radius of the circle, curve or spiral in this point.

Vertical Alignment

The profile alignment, also called long profile.

Widening

Increase / decrease of road width with change in number of lanes.



Leica Geosystems AG, Heerbrugg, Switzerland, has been certified as being equipped with a quality system which meets the International Standards of Quality Management and Quality Systems (ISO standard 9001) and Environmental Management Systems (ISO standard 14001).



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730666 - 4.0.0en

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